



Armed Forces College of Medicine AFCM



II bladder Diseases

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Prof. of Pathology



INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture you will be able to:

- Summarize pathology and complications of (acute & chronic) cholecystitis
- Define cholesterolosis
- Describe the pathology and complications of gall stones
- Describe pathologic features of gall bladder tumours
- Explain pathogenesis of ascending cholangitis
- Correlate pathologic features of gall bladder diseases with their clinical picture and complications

Lecture Plan



1. Part 1 (15 min): Cholecystitis
2. Part 2 (20 min) :Gall stones
3. Part 3 (10 min):tumours & cholangitis
4. Lecture Quiz (5 min)

Cholecystitis



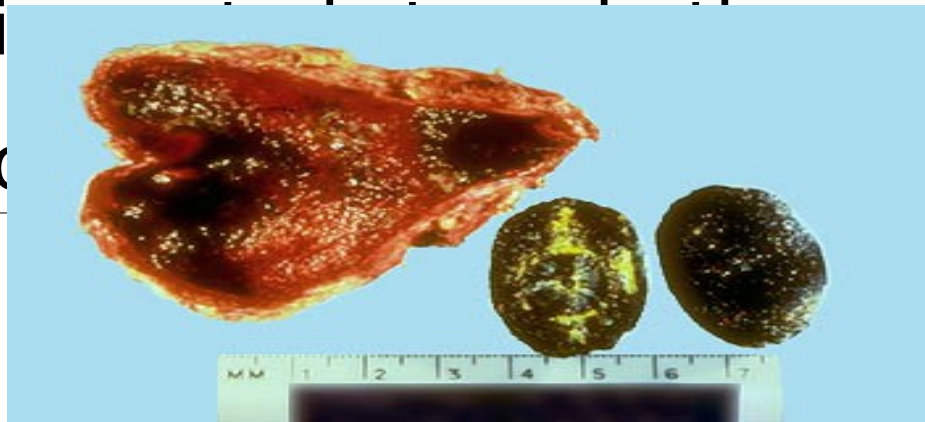
Acute

Chronic

1.Acute Calculous Cholecystitis

Predisposing factor :

By concentrated bile due to



<http://patologia.gabeents.com/data/Pathologic/liv5/liv510.jpg>

2.Acute Acalculous Cholecystitis

Predisposing factor :

- Chemical injury due to change in composition of bile
- Bacterial infection leading to sepsis
- Severe trauma

Clinical Picture of Acute Cholecystitis



**Fever
leucocytosis**

Jaundice

**pain tenderness
in upper right
quadrant**

Fat intolerance

Distension



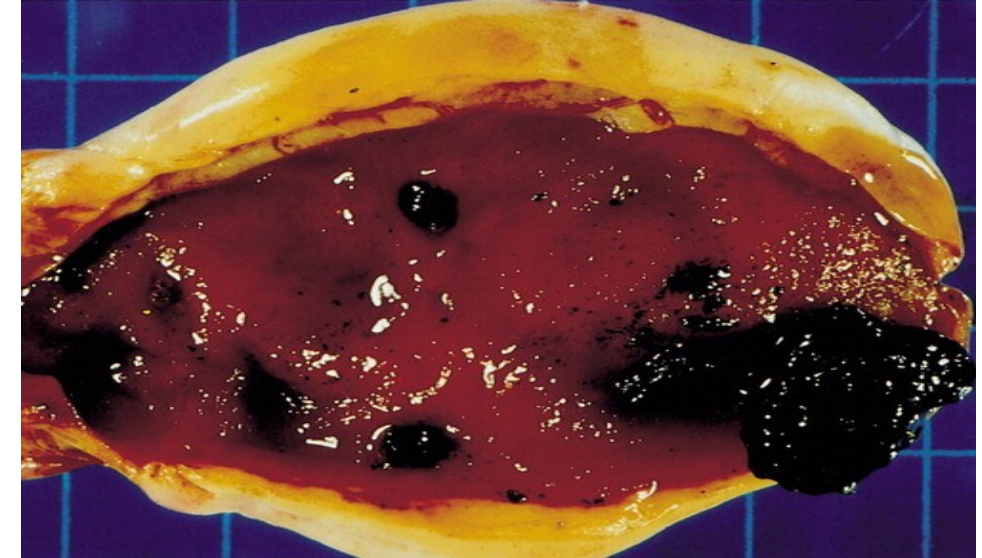
<http://ranapileshospital.com/wp-content/uploads/2014/03/cholecystitis-1.jpg>

Acute Cholecystitis

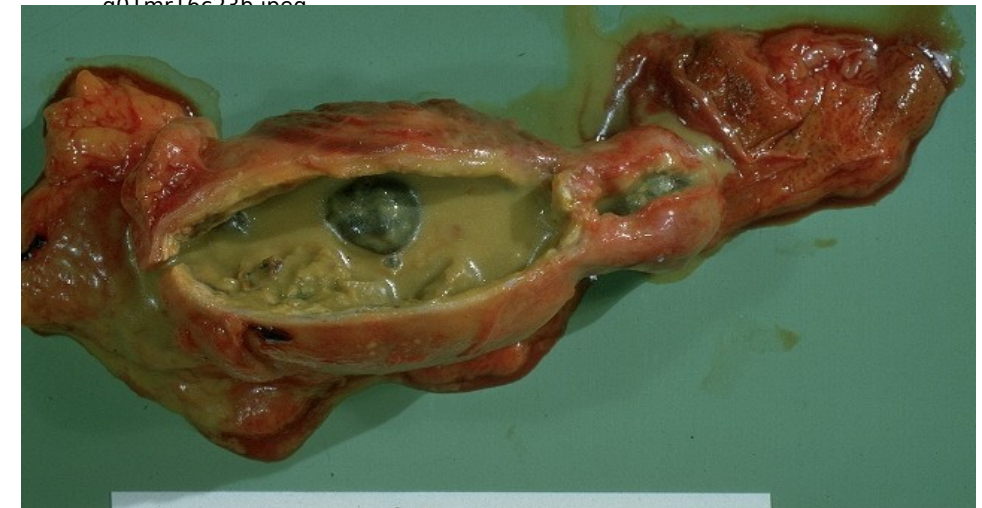


Gross:

- Lumen
 - Stones usually present
 - Filled with turbid bile
 - **Empyema** = gall bladder filled with pus due to obstruction of cystic duct + pyogenic infection
- Wall : thickened by edema
- Peritoneum : congested



<https://pubs.rsna.org/na101/home/literatum/publisher/rsna/journals/content/radiographics/2001/radiographics.2001.21.issue-2/radiographics.21.2.g01mr16295/20151202/images/medium/g01mr16c22b.jpg>



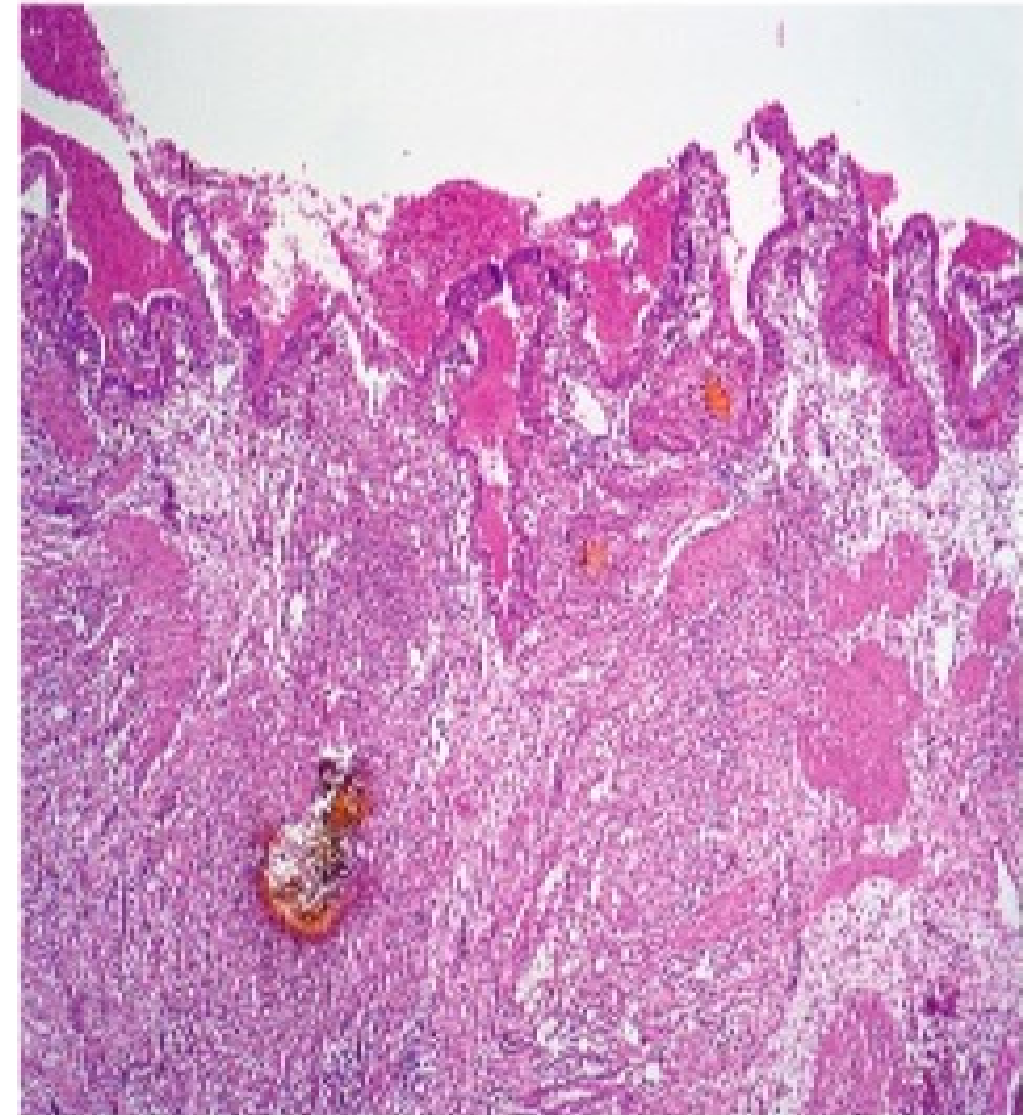
<http://web.med.unsw.edu.au/pathology/Pathmus/1658039.jpg>

Acute Cholecystitis



Mic:

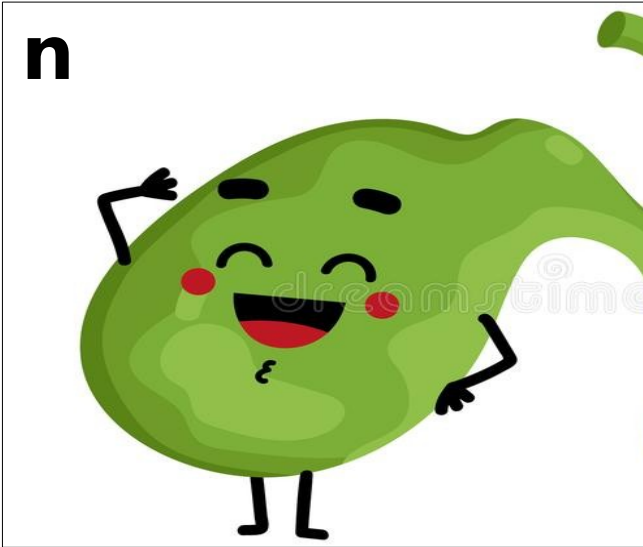
- 1. Ulceration**
- 2. Mixed inflammation & congestion**
- 3. Edema & hemorrhage**



Fate of Acute Cholecystitis



1. Resolution



<https://thumbs.dreamstime.com/b/human-gallbladder-cute-cartoon-character-human-gallbladder-cute-cartoon-character-body-anatomy-element-health-medical-sign-106309807.jpg>

2. Chronic cholecystitis

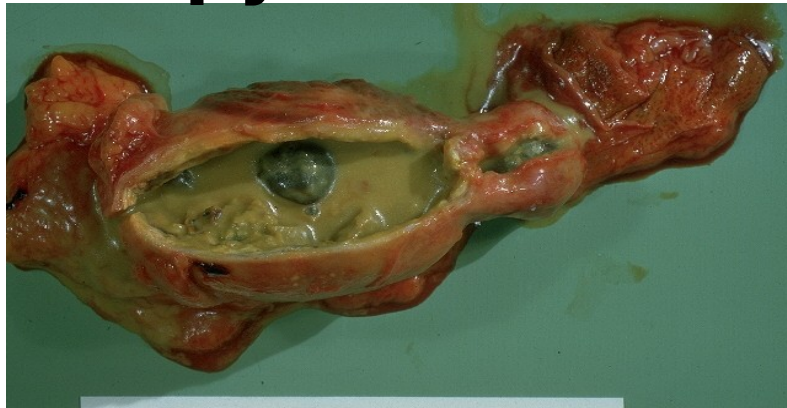


https://clinicalgate.com/wp-content/uploads/2015/03/c00037_f037-007-97814557074781.jpg



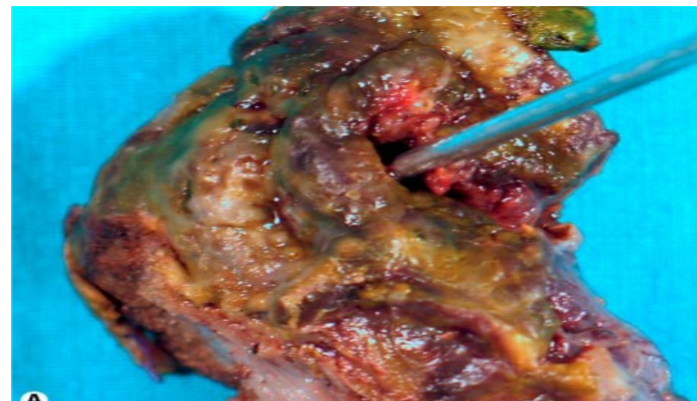
Due to obstruction of vessels by distended bladder

4. Emphyema



<http://web.med.unsw.edu.au/pathology/Pathmus/>

5. Perforation



GIT & Metabolism module

https://www.researchgate.net/profile/Mario_Pirisi/publication/232444842/figure/fig2/AS:6313705625541647@1427084257421/Gross_appearance

Chronic Cholecystitis



Pathogenesis :

1. Following repeated attacks of acute

2. Long standing stones use chronic



C/P:

Recurrent attacks of right upper quadrant pain.

Nausea, vomiting, and intolerance for fatty foods

Chronic Cholecystitis

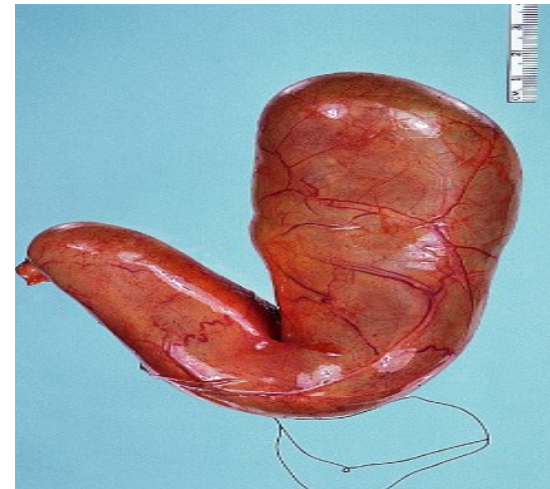


Gross Cholecystitis

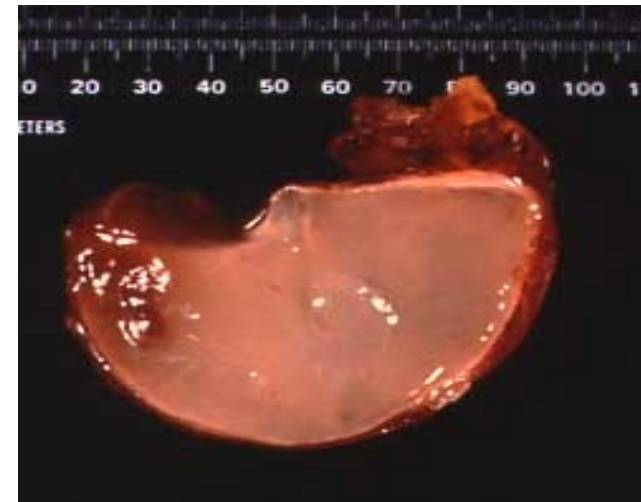
- 1. Lumen :** Gall stones usually present
- 2. Mucosa** may be focally ulcerated
- 3. Wall:** thickened by fibrosis
- 4. Obstruction of cystic duct by stone may lead to**
 - a. Hydrops:** Distention with clear fluid



<https://www.telepathology.com/cases/images/gall1a.jpg>



hydrops



mucocel

Chronic Cholecystitis



Mic:

1. Mucosa :

Ulceration-hyperplasia or metaplasia

2. Transmural chronic inflammatory infiltrate

3. Rokitanski Aschoff sinuses : diverticulae in muscle layer

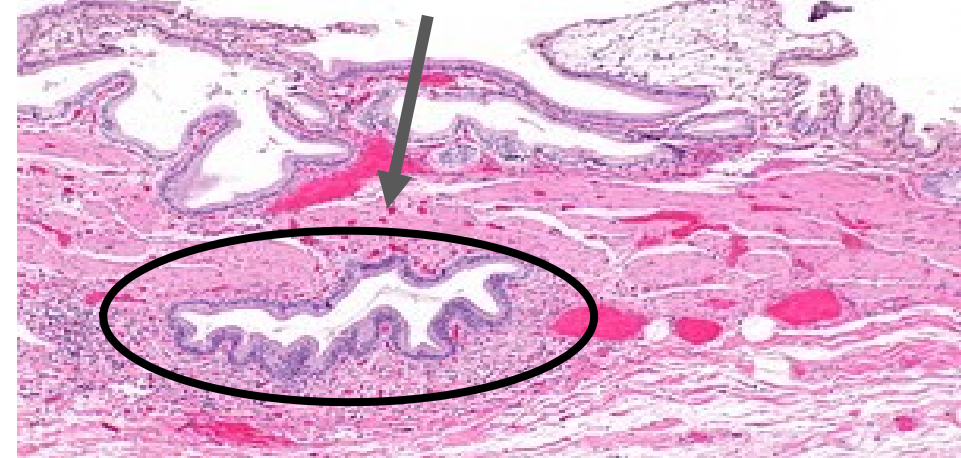
4. Submucosal & subserosal fibrosis

GIT & Metabolism module



<https://i.pinimg.com/originals/35/df/47/35df4772cff950b9001e2a6c6a8052a3.jpg>

Rokitanski Aschoff sinuses :



https://librepathology.org/w/images/thumb/7/7d/Chronic_cholecystitis_and_cholesterolosis_--_low_mag.jpg/300px-

Chronic Cholecystitis



Complications:

- Bacterial superinfection
- Perforation
- Recurrent acute attacks
- Formation of gall stones (80 % of cases)



https://images-prod.healthline.com/hlcmsresource/images/galleries/gallstones/642x361_Gallstones_SLIDE_2.jpg



<https://i.pinimg.com/originals/87/>



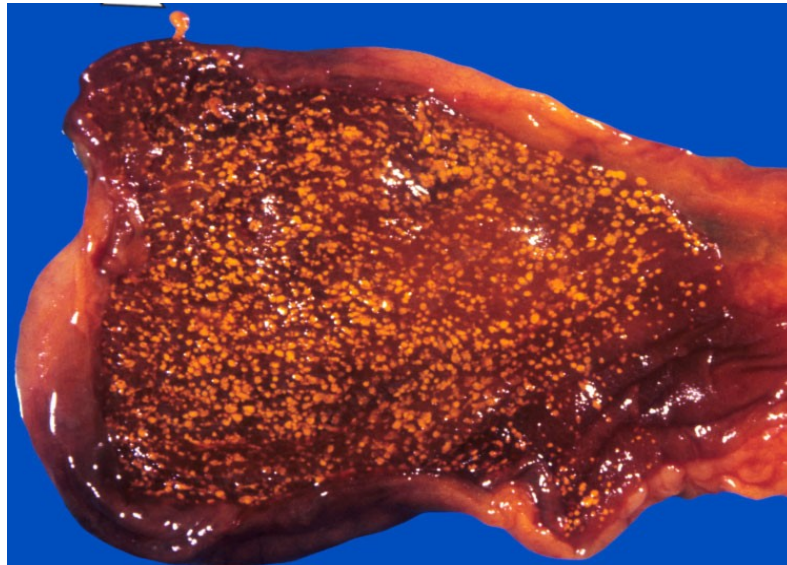
<https://cdn4.vectorstock.com/i/1000x1000/74/43/human-sick-gallbladder-cartoon-character-vector-19187443.jpg>

Cholesterolosis



Def:

- Accumulation of **cholesterol laden macrophages** in the **mucosa** of GB.
- With **cholesterol** stones (bile saturated with



<https://basicmedicalkey.com/wp-content/uploads/2017/04/image02871.jpeg>



<https://i.pinimg.com/originals/35/8b/57/358b574b259c014e0bafd9d3978b08a1.jpg>

mucosa >>> **yellowish flecks** similar to
strawberry

Cholecystitis & Cholesterolosis (Quiz)



Match

**1.Acute
cholecystitis**

**2.Rokitansky
Aschoff sinus**

3.Cholesterolosis

**a.Distension of GB
by clear fluid**

**b. accumulation of
cholesterol laden
macrophages in
mucosa
of GB**

**c. Stone or Chemical
change**

d.Chronic cholecystitis

Cholecystitis & Cholesterolosis (Quiz)



Match

**1.Acute
cholecystitis**

C

**2.Rokitansky
Aschoff sinus**

d

3.Cholesterolosis

b

**a.Distension of GB
by clear fluid**

**b. accumulation of
cholesterol laden
macrophages in
mucosa
of GB**

**c. Stone or Chemical
change**

d.Chronic cholecystitis

Cholelithiasis



Def: Stones in the lumen of **gall bladder**

Gall stones classified according to their chemical nature into:

Cholesterol

Stones

**1. Pure Cholesterol
Stones**

2. Mixed Stones

Pigment Stones

1. Black

2. Brown

Cholelithiasis

Pathogenesis

Abnormal bile composition

2. Bile Stasis :

**3. Inflammation
(leads to mixed
stones)**

Cholelithiasis



Pathogenesis :

1- Abnormal composition of the bile:

a. ↑ Cholesterol (hypercholesterolemia) eg obesity → pregnancy

↓ **Cholesterol stones**



b. ↑ Bile salts concentration (in inflammation)



Mixed stone

NB: cholesterol is held in solution by action of bile salts.

Increase cholesterol or decrease bile salts

leads to super saturation of the bile by cholesterol



Cholelithiasis



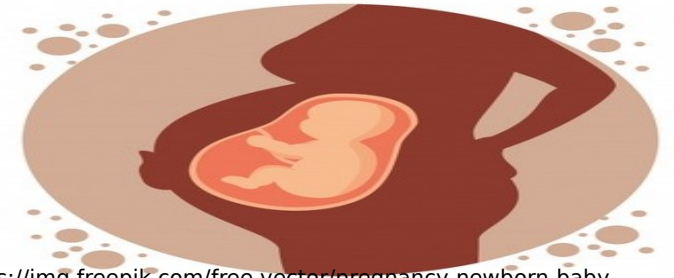
Pathogenesis :

2- Stasis of bile:

- ✓ eg: Due to pregnancy or obstruction of cystic duct
- ✓ Leads to: 😊 Precipitation of bile constituents
😊 Inflammation

3. Inflammation leads to mixed stones due to:

- ✓ Decrease concentration of bile salts
- ✓ Formation of nucleus (bacteria, fibrin, cell debris) around which bile becomes precipitated.

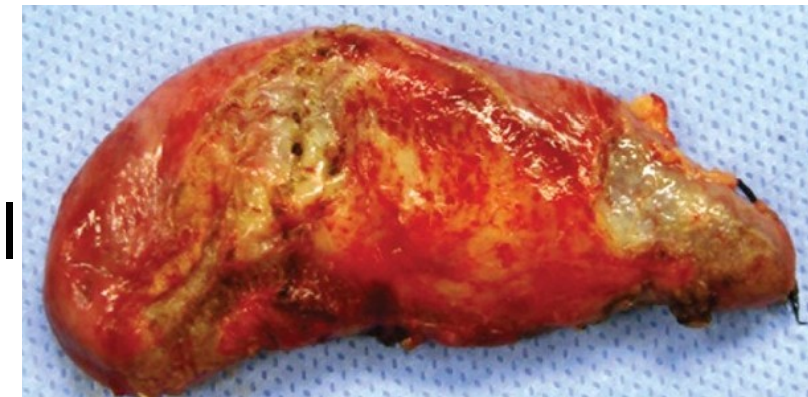


https://img.freepik.com/free-vector/pregnancy-newborn-baby-icon_24877-3337.jpg?size=338&ext=jpg

When stone gets stuck in the entrance, gallbladder gets distended and wall becomes tense. That's when the pain occurs. Usually it happens when you eat greasy food late at night



https://portal.kdischool.ac.kr/ext_link_proxy/http/doctordangam.com/wp-content/uploads/2016/12/34-2.jpg



Types of Cholelithiasis (gall stones)



Cholesterol stones

a. Pure Cholesterol stone (10%):

- 90% cholesterol-**Usually single**
- **Yellow-mulberry** outer surface
- Associated with **Cholesterol**



<https://i0.wp.com/www.namrata.co/wp-content/uploads/2012/11/gall2.png>

b. Mixed stone (80%):

- Cholesterol, Ca bilirubinate & Ca carbonate
- **Multiple Faceted smooth** outer surface



<https://www.sciencesource.com/Doc/TR7/f/1/d/6/SS2800713.jpg?d6364454582>

Types of cholelithiasis (gall stones)



II. Pigment stones

a. Black Stones

- High calcium bilirubinate- **M**
- Friable
- associated with **hemolytic anemia**



b. Brown Stones:

- Friable
- **Laminated** cut surface
- associated with chronic **cholecystitis & stasis**

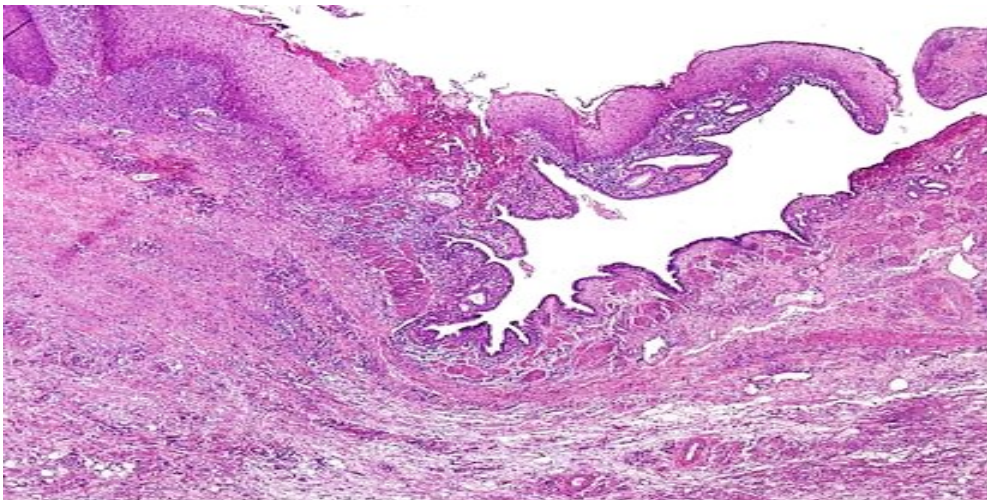


Gall Stones Complications



- **Inflammation**
1-Local
>cholecystitis

- **Squamous**
Metaplasia



2-Perforation

Acute
Suppurative
Peritonitis

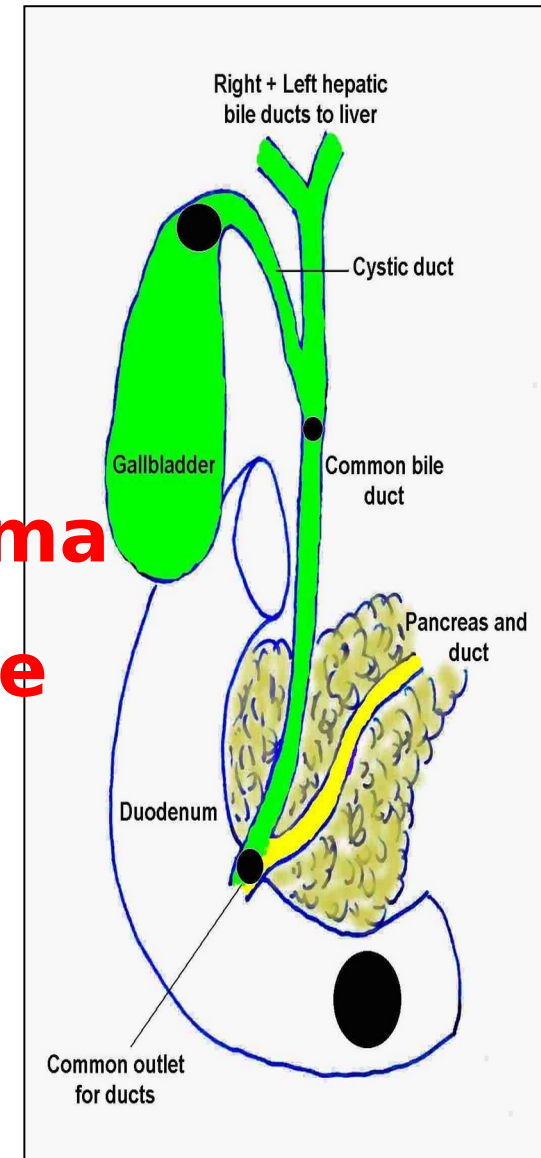
3-Obstruction

Gall Stones Complications



3-Obstruction of :

- **Cystic duct:**
 - ✓ **Biliary Colic**
 - ✓ **Cholecystitis**
 - ✓ **Hydrops , mucocele, empyema**
- **Common bile duct : Obstructive jaundice**
- **Ampulla of Vater : Acute Pancreatitis**
- **Small intestine (Gall Stone Ileus)**



<http://i27.photobucket.com/albums/c190/lovesthesunset/anatomy%20and%20physiology/bileduct.jpg>

GIT & Metabolism module

http://www.unboundedmedicine.com/wp-content/gallery/gallstone_ileus.jpg

Gall stones (Quiz)



A 12 year old male presents with recurrent severe right upper quadrant colicky abdominal pain. At time of surgery multiple black stones are found in the gall bladder. Biochemical investigation reveals that they are rich in bilirubin .What would you suspect to be present in this child ?

- a. Amaebic hepatitis
- b. Hemolytic anemia
- c. Acute pancreatitis
- d. High cholesterol

Gall stones (Quiz)



A 12 year old male presents with recurrent severe right upper quadrant colicky abdominal pain. At time of surgery multiple black stones are found in the gall bladder. Biochemical investigation reveals that they are rich in bilirubin .What would you suspect to be present in this child ?

- a. Amebic hepatitis
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- d. High cholesterol

Tumours of Gall bladder



Benign

Adenomatous polyp

Fibroma

Lipoma

Leiomyoma

Malignant

Carcinoma



https://rojosonmedicalclinic.files.wordpress.com/2015/08/gallbladder_ca-1.jpg

Gall Bladder Carcinoma



More in females, predisposed by gall stones.

Gross: Infiltrative with diffuse wall thickening

or Fungating mass

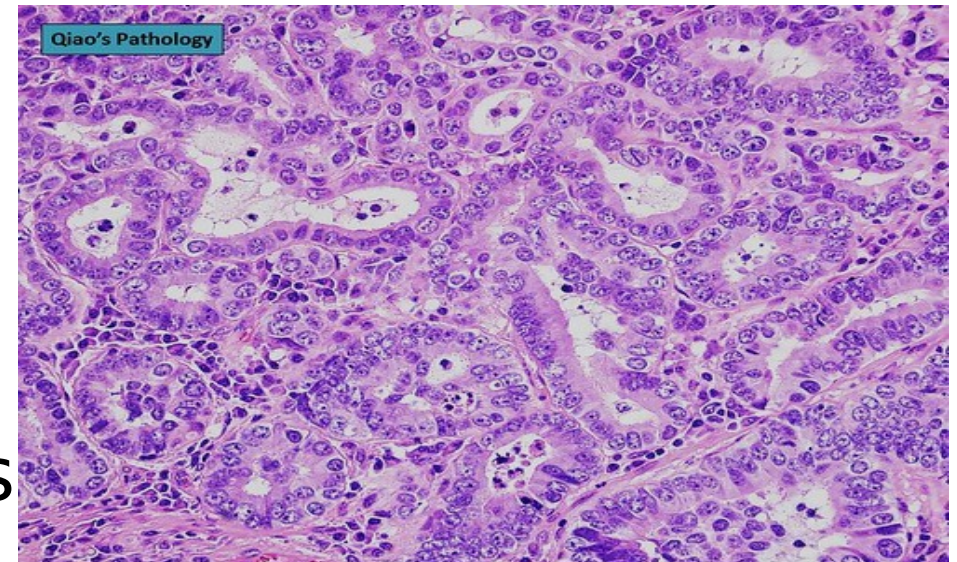
Micro: Adenocarcinoma (usually)
Squamous cell carcinoma
(on top of squamous metaplas

• **Spread:**

• Direct



<https://medtube.net/images/min/ef8f94395be9fd78b7d0aeecf7864a03/620/620/0>



https://farm1.static.flickr.com/348/19136922894_4b537e6c32.jpg

Ascending cholangitis

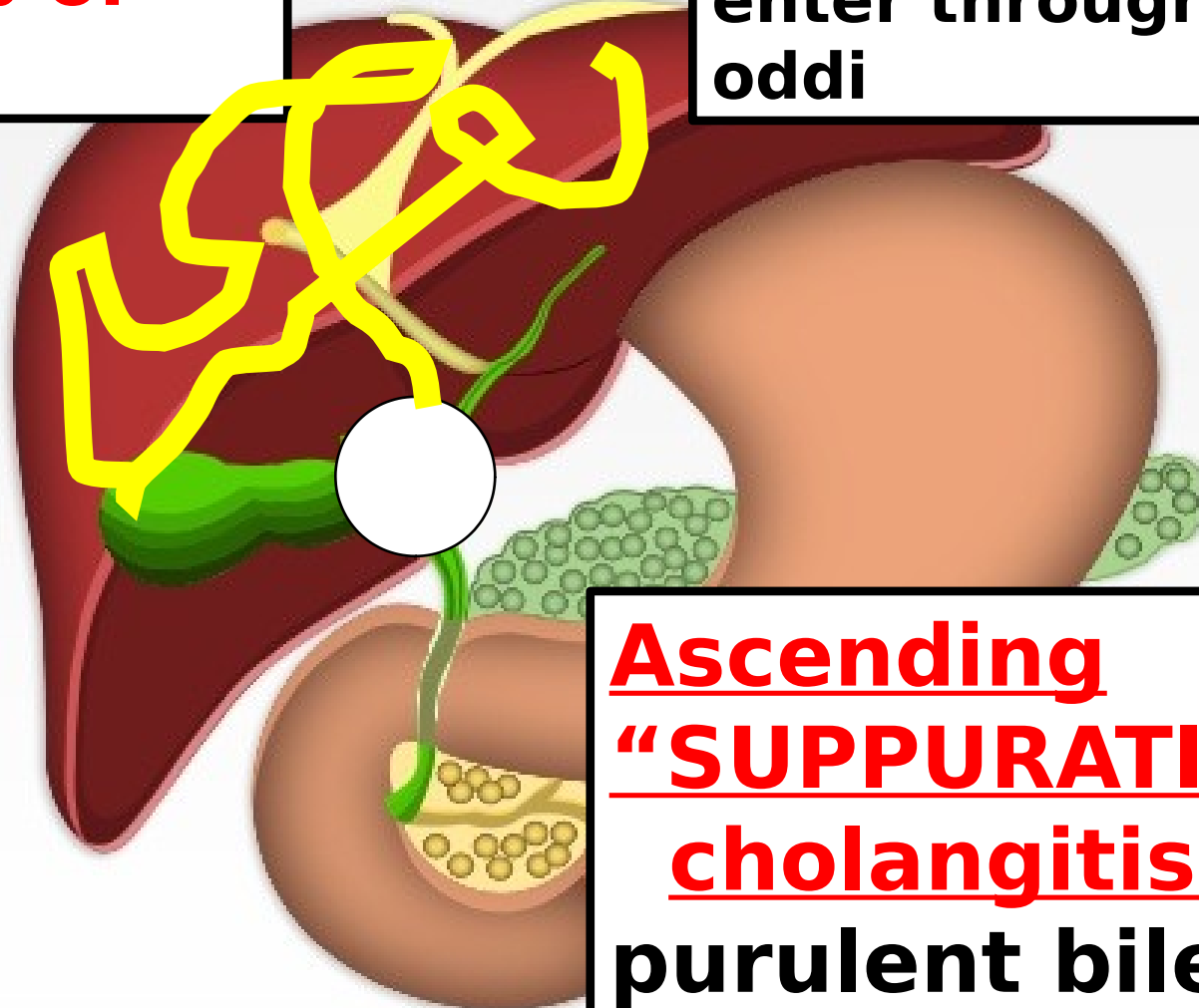


Def:

**Intrahepatic biliary ducts
infection +/- on top of
obstruction**

Pathogenesis

**E. coli, Klebsiella
enter through sphincter of
oddi**



Pdf

- Stone
- Neoplasm
- Stricture
- catheters/
stent

**Ascending
“SUPPURATIVE”
cholangitis**

purulent bile distends

Cholecystitis & Cholesterolosis (Quiz)



A fatty female presents with repeated biliary colic underwent cholecystectomy .The gross pathology revealed strawberry like inner wall of gall bladder with a whitish stone at the neck of gall bladder. Which is the most likely etiology?

- a. Empyema
- b. Cholesterolosis
- c. Cholangiocarcinoma
- d. hydrops

Cholecystitis & Cholesterolosis (Quiz)



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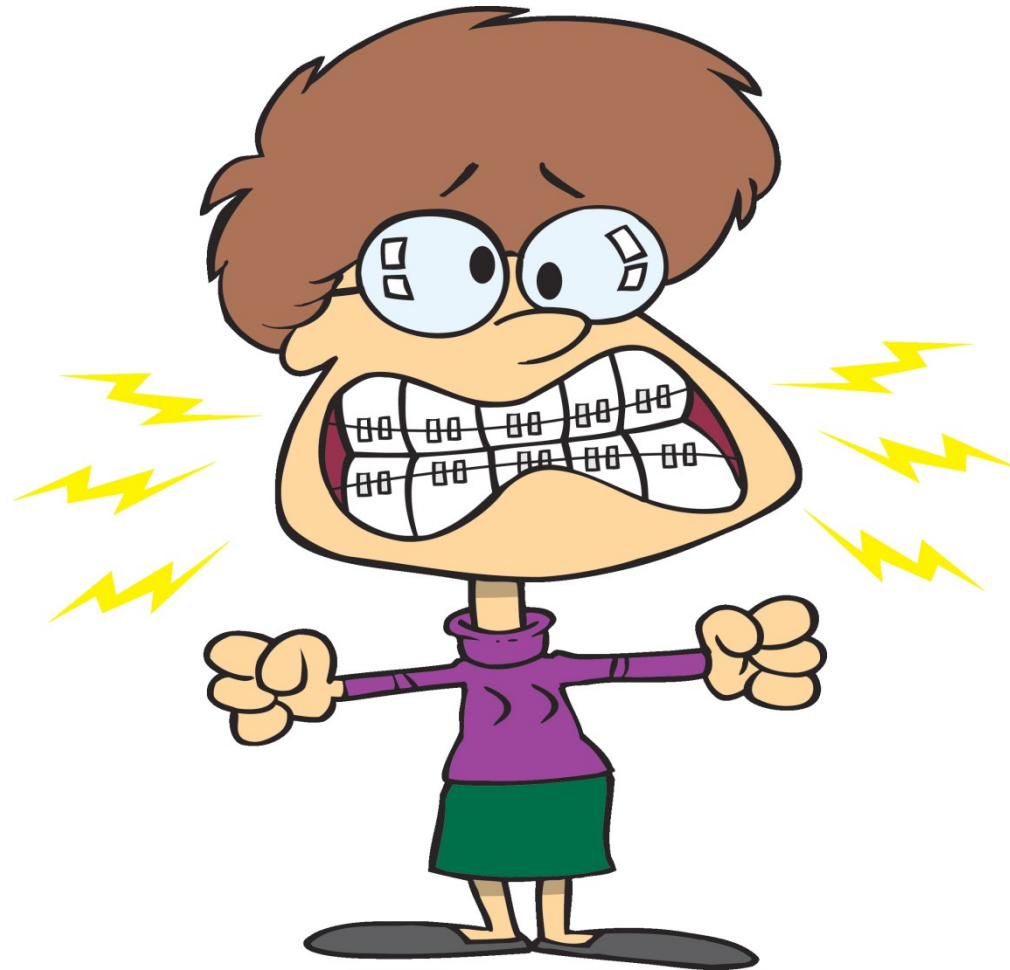
d. hydrops

Keypoints



- Acute cholecystitis : causes ,gross and microscopic
- Chronic cholecystitis : causes ,gross and microscopic
- Gall stones : causes ,associated conditions complications
- Ascending cholangitis

Thank you



Suggested Text book



Neil D. Theise. Liver and gall bladder. In Robbins and Cotran
pathologic basis of disease, 10th edition. Kumar, Abbas &
Aster (eds). Elsevier Saunders. Pages 637-676